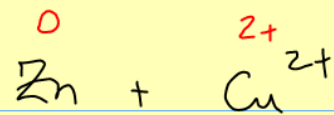


Oxidation Numbers.

May 26, 2011.

Oxidation numbers are the apparent charge on an atom that it appears to have from gaining or losing its bonding electrons.

These numbers do not always represent actually, but are useful for identifying oxidation and reduction



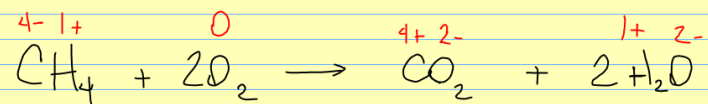
To assign oxidation numbers we use the following rules:

- ① the oxidation number for any lone ion is its charge.
- ② the oxidation number for an element is always zero.
- ③ hydrogen atoms are +1 unless they are in a metal hydride, where they are -1

- ④ oxygen is usually -2 , unless it is in a peroxide, where it is -1 .
- ⑤ the oxidation number of alkali metals in compounds is $+1$
- ⑥ the sum of oxidation numbers in a compound is zero, so remaining elements are determined by algebra.

Example #1 : Determine which atom is oxidized and which is reduced in the reaction:

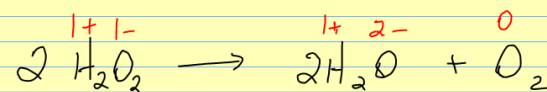
$$\text{CH}_4 + 2\text{O}_2 \rightarrow \text{CO}_2 + 2\text{H}_2\text{O}.$$



red: O

ox: C⁴⁻

Example #2: Hydrogen peroxide decomposes into water and oxygen gas by the reaction: $2\text{H}_2\text{O}_2 \rightarrow 2\text{H}_2\text{O} + \text{O}_2$
Determine the oxidation number for all the atoms.



P 381 P 1 a-d), 2 a-d),

P 383 P 3 a-d).

